

(No Model.)

A. S. KROTZ & W. P. ALLEN.

ELECTRICAL CONTACT DEVICE FOR SUBWAYS OR CONDUITS.

No. 559,586.

Patented May 5, 1896.

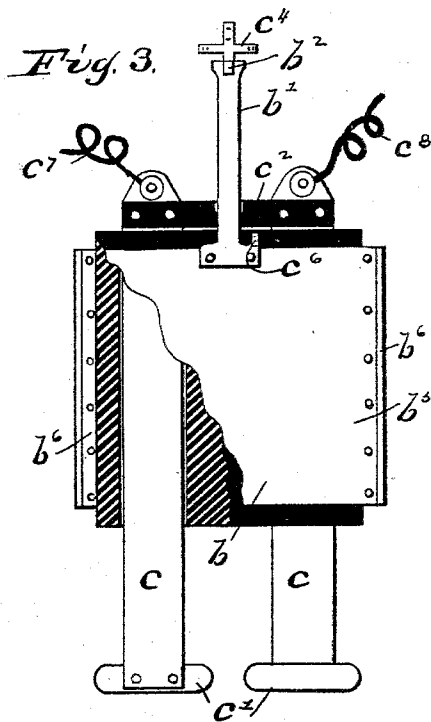
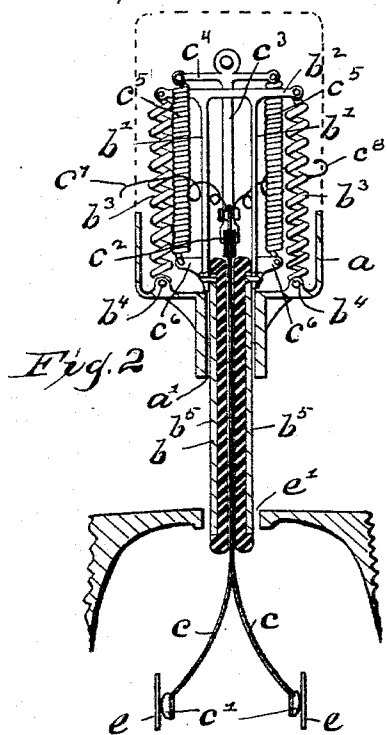
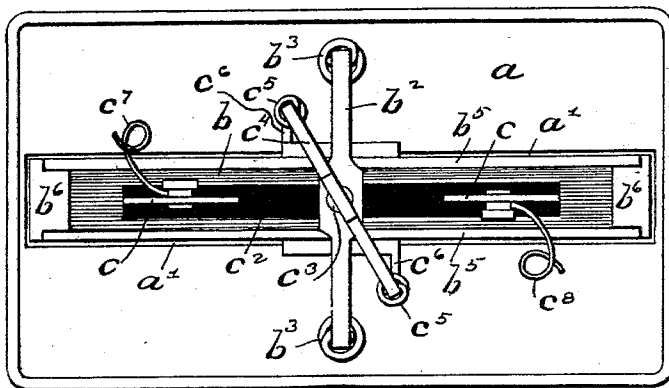


Fig. 1



Witnesses
Ed Walker
Chas. J. Mehl

Inventors
Almon S. Krotz
And William P. Allen
By their Attorneys
Ed. A. Mott

UNITED STATES PATENT OFFICE.

ALVARO S. KROTZ, OF SPRINGFIELD, OHIO, AND WILLIAM P. ALLEN, OF CHICAGO, ILLINOIS, ASSIGNORS OF ONE-THIRD TO OLIVER S. KELLY, OF SPRINGFIELD, OHIO.

ELECTRICAL CONTACT DEVICE FOR SUBWAYS OR CONDUITS.

SPECIFICATION forming part of Letters Patent No. 559,586, dated May 5, 1896.

Application filed November 14, 1895. Serial No. 568,993. (No model.)

To all whom it may concern:

Be it known that we, ALVARO S. KROTZ, residing at Springfield, Clark county, Ohio, and WILLIAM P. ALLEN, residing at Chicago, in the county of Cook and State of Illinois, citizens of the United States, have invented certain new and useful Improvements in Electrical Contacting Devices for Subways or Conduits, of which the following is a specification.

Our invention relates to improvements in contacting devices especially designed for use with subways or conduits in which a slotted opening is employed through which the supporting-standard of the contacting device or trolley is adapted to extend.

The object of our invention is to provide a contacting device of simple construction, which is adapted to be raised or lowered through the slotted opening in said conduit or subway, the construction being such that the moving contacting devices or trolleys may be thrown out of or into engagement with the conductors in said subway or conduit. We attain these objects by the construction shown in the accompanying drawings, in which—

Figure 1 is a plan view of a device embodying our invention. Fig. 2 is a transverse sectional view of the same. Fig. 3 is a partial sectional elevation of the same.

Like parts are represented by similar letters of reference in the several views.

In the said drawings, *a* represents a supporting frame or casing, which may be of any suitable or desirable shape and construction. We have shown a simple supporting-frame, but it may be found desirable to construct this in the form of a casing which will completely inclose the parts, as illustrated by dotted lines in Fig. 2. This frame or casing *a* is designed to be connected to the moving car or vehicle in any well-known and suitable manner. It is provided at the center with a slotted opening *a'*, in which there is supported a movable head *b*, to which there are secured vertical standards *b'*, carrying at their top a cross-bar *b²*. The cross-bar *b²* is extended at each end beyond the standards *b'* and to the outer extremities are attached springs *b³*, preferably of the coiled extensible type, the remaining ends of said springs be-

ing connected to suitable hooks or projections *b⁴* on the frame *a*. This head *b* preferably consists of metallic plates *b⁵*, preferably of steel, which are riveted together at the ends through spacing-blocks *b⁶*, which are preferably shouldered down to receive the plates, as shown. The intermediate space between the plates and the spacing-blocks is filled with insulating material, such as indurated fiber or other similar effective insulator, and through the insulator thus formed there is provided two narrow openings, which extend from the top to the bottom of the head *b* and through which there is extended spring-standards *c c*, which are adapted to slide vertically in said openings and through the insulator. These spring-standards *c c* are connected together at the top by a cross-bar *c²*, also of insulating material, and connected to the said cross-bar and extending upwardly therefrom is a rod or stem *c³*, which carries thereon at a point above the cross-bar *b²* an arm *c⁴*. To the extremities of the arm *c⁴* there are connected springs *c⁵*, the lower ends of which are attached to suitable hooks or projections *c⁶* on the head *b*. If desired, and to prevent unnecessary expansion of the supporting-frame, the cross-bar *b²* and arms *c⁴* may be placed at an acute angle to each other, as shown in Fig. 1.

The springs *c⁵* are formed of a less tension or resiliency than the springs *b³*, so that the standards *c c* may be raised and lowered, thus expanding said springs without raising or lowering the head *b*. The standards *c c* are provided at their lower ends with contacting shoes *c'*, which are adapted to contact with the conductors *e* in the subway or conduit, the head or sleeve post *b* being adapted to extend down through the slotted subway or conduit, as shown at *e'* in Fig. 2. The spring-standards *c* are so formed that when forced downwardly through the head or sleeve post *b* they will be projected outwardly in opposite directions, so as to bear against the inside of the respective conductors and be held yieldingly in contact therewith. An electrical connection is formed from the spring-standards *c c* to the motor through suitable conducting-wires *c⁷ c⁸* in the usual way.

From the above description it will be un-

derstood that the head or sleeve post *b* is formed of a size to permit it to enter the slotted opening *e'* of the subway or conduit, with the contacting devices on the spring-standards in contact with the conductors in said conduit. In raising the contacting device out of said slotted way or conduit the rod *c*³ is moved vertically, thus raising the spring-standards *c* through the head or sleeve post until the contacting shoes are drawn upwardly and inwardly and rest in contact with and below the lower end of said head or sleeve post, the yielding of the springs *c*⁵ permitting this operation. As soon as the shoes *c'* have been sufficiently elevated a further upward movement of the rod *c*³ will cause the head or sleeve post to move vertically through the slotted opening in the frame, the yielding of the springs *b*³ permitting the upward movement until the head or sleeve post has cleared the conduit or subway. In lowering the contacting device into place the operation is reversed. The rod *c*³ is lowered, and the springs *b*³, being under tension and of a greater elastic strength than the springs *c*⁵, will cause the head or sleeve post to be moved downwardly until it enters the slotted opening *e'*, after which the continued movement of the rod *c*³ will permit the spring-standards to be forced downwardly, through the agency of the springs *c*⁵, through the head *b*, and, by the resiliency of said spring-standards, to move outwardly, so as to contact with the conductors in said conduit.

It will be seen from the above description that we are enabled to raise and lower the contacting devices from or into the conduit or subway at any time and at any point in the line of said subway, as the contacting devices are adapted to be brought into a space less than the width of the slotted opening, the construction being such that all the operating parts necessary to pass through the slotted opening may be made in a full-sized device, so as to require not over seven-eighths of an inch.

It is obvious that any suitable mechanism may be employed for raising and lowering the standard or rod *c*³. It may be provided with a simple handle adapted to be grasped by the operator and raised vertically or it may be connected to any other well-known and suitable mechanical device by which motion may be imparted thereto.

We have described the above invention as employing two contacting devices, such as designed for a return-circuit. It is obvious that the same constructions could be applied to a ground return where a single conductor or contacting device is employed in the subway or conduit.

Having thus described our invention, we claim—

1. In a contacting device, the combination with the supporting-frame, a movable head or post, and sliding contacting devices in said head or post and insulated therefrom, said

contacting devices being constructed to move inwardly and outwardly as they are raised or lowered, a yielding connection from said contacting devices to said post, and a yielding connection from said head or post to said frame, substantially as specified.

2. In a contacting device, a supporting-frame; a movable head or post supported in said frame, and movable sliding standards insulated in said post and provided at their lower ends with contacting shoes, said standards being constructed of resilient metal adapted to spring outwardly in opposite directions when moved downwardly through said head or post, a raising and lowering device connected to said standards, a connection from said raising and lowering device to said head whereby said head is caused to move after said standards have been moved to a limited extent, substantially as specified.

3. The combination with a supporting-frame and a movable head, sliding standards in said head and insulated therefrom, contacting devices on said standards adapted by a vertical movement of said standards to be forced outwardly and inwardly in opposite directions, as described, a lifting device connected to said standards, and a connection from said lifting device to said head whereby said head is adapted to be moved in either direction by said lifting device after a limited movement of said standards, substantially as specified.

4. The combination with the supporting-frame having a slotted opening therein, a sliding head or sleeve-post in said frame, springs connecting said head to said frame, standards mounted slidably in insulated bearings in said head or post, and a lifting device connected to said standards, a spring connection from said lifting device to said head, said standards and post being so constructed as to cause said standards to move outwardly and inwardly in opposite directions as they are lowered or raised in said head or post, substantially as specified.

5. The combination with the supporting-frame having a slotted opening therein, a head or sleeve-post formed of metallic plates secured together at the ends by spacing-blocks so as to inclose an insulating-block as described, sliding spring-standards extending through said insulating-block and connected together by an insulating-bar, a lifting-bar connected to said insulating-bar, and springs from said lifting-bar to said head or post, and a spring connection from said head or post to the frame, the spring connection between said head and frame having a greater tension than the spring between said moving device and head or post, substantially as specified.

6. The combination with the supporting-frame, a movable head, a sleeve-post therein, a sliding standard in said sleeve-post, a shoe on said standard, said standard being formed so as to move outwardly and inwardly as it is raised vertically through said post, a lifting

device connected to said standard, and a connection from said standard to the head or post whereby said head or post is moved after a limited movement of said standard, substantially as specified.

7. A contacting device consisting essentially of spring-standards having contacting shoes, a supporting-post formed of steel plates secured together through the medium of spacing-blocks, and insulating material included between said plates and spacing-blocks, and a frame for supporting said head or post, substantially as specified.

8. A contacting device consisting essentially of a supporting-post, a standard slidably mounted in said post and insulated therefrom, a contacting device on the end of said standard, said post being constructed so as to deflect said standard laterally as the same is moved longitudinally through said post, substantially as specified.

9. A contacting device consisting essentially of a supporting-post, standards slidably mounted in said post and insulated therefrom and from each other, said parts being so constructed as to cause the free ends of said standards to move laterally in opposite directions from said post when moved longi-

tudinally through the same, substantially as specified.

10. In a contacting device, the combination with a supporting-frame, of a head or post having sliding contacting devices therein, which contacting devices are insulated therefrom, said contacting devices being constructed to move inwardly and outwardly as they are raised or lowered through said post so as to unmake or make a yielding contact on opposite sides of said post and laterally beyond the same, substantially as specified.

11. A contacting device consisting essentially of a supporting-post, a spring-standard slidably mounted in said post and insulated therefrom, the contacting end of said standard being formed on a curve, the curved portion adapted to be straightened when drawn into said post and move laterally from said post when moved longitudinally through said post, substantially as specified.

In testimony whereof we have hereunto set our hands this 29th day of October, A. D. 1895.

ALVARO S. KROTZ.
WILLIAM P. ALLEN.

Witnesses:

OLIVER H. MILLER,
CHAS. I. WELCH.